DXers
The Carolina DX Association

The Pileup

Carolina DX Association

AUGUST, 1990 BILL TAYLOR - KD4IL - EDITOR

C6AFR - Bahamas - June Contest
Written by WA4VCC

Five members of the Carolina DX Association and their XYLs ventured to the Bahamas in hopes for favorable conditions for the June VHF Contest. The odds, of course, were in their favor, BUT NEVER A SURE BET.

The group arrived Wednesday before the 'test' at Treasure Cay on the Great Abaco Island— grid locator FL16. Antennas went up for 6, 2, 432, Oscar 13 and 10 thru 20 meters. The gear consisted of two FT-736Rs, various 'bricks' and a FT-757GX for the HF frequencies.

The group had received a specially assigned call of C6AFR for their stay. A special thanks goes to the Bahamas Telecommunications Corporation for their cooperation in issuing the C6 call.

BINGO! Thursday morning—June 7th—six meters opened to the eastern half of the US and at the same time the first two meter contact was made via meteor scatter with a NC station. On Thursday afternoon C6AFR had pile-ups on Oscar 13 and 17 meters.

Friday was pretty much devoted to snorkeling and catching a few rays, but Saturday morning the fun began. Although six meters had calmed down a bit by the time the contest began at 1800 UTC, the Wls, 2s, 3s, 8s, 9s, and 0s were still in there. Unfortunately at 2200 UTC, 6M died and the group then worked ground-wave in Florida on 6, 2 and 432.

Sunday morning at 1100 UTC, six opened again and stayed opened most of the day...single hop only. The last QSO was a new multiplier in Louisiana with two minutes left to go in the contest. The following MONDAY TUESDAY six meters was DEAD. Someone had 'pulled the plug.'

During the six day period, C6AFR made over 700 QSOs on the VHF/UHF bands, a couple of hundred on Oscar 13 and a logbook full on 20, 17, 15, 12 and 10 meters.

Operators were AA4R, AA4SC, K4MQG, KB4CSE, WA4UNZ and WA4VCC.

QSL Manager for the operation is K4MQG.

Ted F. Goldthorpe
WA4VCC
July 10, 1990
(More pictures on page 3)

Grounding Techniques for Radio Installations
by Gary Coffman KE4ZV

There are three main reasons to ground radio equipment::

1. Safety grounding to protect operators from accidental electrical shock.
2. RF grounding to prevent spurious and harmonic radiation and to enhance antenna efficiency.
3. Lightning protection.

Each of these require different grounding technique. A careful analysis of the ground methods used is required to determine if all three objectives are met.

Safety grounding is in many ways the easiest criteria to meet. Simply bonding all equipment cabinets to the power company ground with conductors of low resistance and adequate current carrying capacity to blow the circuit breakers will meet safety requirements.

Effective RF grounding is often much harder to achieve. The ground path must not offer any significant impedance at the frequencies of interest. Since the frequencies of interest are often octaves apart, this is challenging. The frequencies of interest are the fundamental frequency of the transmitter, the harmonic frequencies of the transmitter, and any spurious frequencies the transmitter may generate. The latter is usually the toughest.

Grounding for lightning protection is difficult due both to the magnitudes of the voltages and currents involved and to the fact that the lightning waveform is a step function and has considerable RF energy.

Probably the WORST problem one faces in designing an effective grounding system is the prevention of GROUND LOOPS. Ground loops will cause unintended currents to flow in circuitry, often with disastrous effects. Either damage or degraded operation will inevitably be the result of a ground loop.

The best method of securing a good ground for a radio installation is to use a GROUND WINDOW. The ground window technique requires that every cable that enters or leaves the radio room pass through one small area where all ground connections are made.

The power company ground must be bonded to the ground window and surge suppressors such as those marketed by Lightning Protection Associates should be installed in series with the hot wires. Note that simple shunt protectors will not be sufficient to protect the equipment in the event of a direct lightning strike. Series protectors are designed to open the circuit under severe overload.

All coaxial cables must have their shields attached to the ground window and have their inner conductors clamped with an arc cartridge designed to fail shorted. In addition the inner conductor should be fused in a manner that will open the line when the arc cartridge fails.
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Telephone cables must enter through the ground window and have their leads clamped with MOVs and arc cartridges that are designed to fail shorted. In addition all leads must be fused in a manner that will open the line when the arc cartridge fails.

Each piece of equipment in the radio room must be attached to the ground window by a wide heavy strap installed so as to be as short and straight as possible. Neatness definitely does not count here. Don't "dress" the ground cable, make it short and direct. Do not "daisy chain" grounds. Make sure that the only path from one piece of equipment to another is via the ground window. This means that interconnecting shielded cables should go from the equipment out to the ground window, have the shield bonded to the groundwindow, then return to the next piece of equipment. This is the only sure way to prevent circulating ground currents.

Now that every piece of equipment in the radio room is at the same potential as the ground window, the ground window must be brought to true earth ground. This is fairly easy for DC and low frequency AC, just make sure the cable is heavy

NEXT PAGE ⟶

Grounding Continued

enough to have the smallest possible voltage drop across it. For RF, inductance and resonance effects must be considered as well as skin effect. A wide flat copper strap that is routed as straight as possible to earth ground is preferred. For maximum lightning protection, the ground strap must never travel upward because the space charge will resist the current flow. Sharp bends will act as single turn inductances and should be avoided. Since a single ground cable will exhibit resonance at certain frequencies due to it's length, several ground cables should be used with each a different length. The lengths should be chosen such that a cable that is near a quarter wavelength at a given frequency will be paralleled by a cable that is near a half wavelength. In practice, several cables varying from the shortest possible length to twice the shortest length should be paralleled so that at least one will present a low impedance at any frequency. Do not coil the longer cables, instead fan them at the center point.

The method used to route cables down the tower will effect the degree of lightning protection achieved. If possible use a plumber's delight type of antenna that is dc grounded to the tower. Route the coax down the inside of the tower, and ground the shield of the coax to the tower at Hs/_.x6 points. This last will short out the single turn transformer formed by the tower and the shield of the cable. Unless this transformer is shorted, currents flowing in the tower to ground will induce currents in the shield of the coax.

The true ground must be more than a single stake driven into the earth. If the tower is ground mounted, use the base of the tower as the center of the ground field, otherwise drive an eight foot ground rod to form the center point of the ground field. Run radials out from the center of the ground field to a buried loop connecting a series of ground rods separated from each other by no less than eight feet. A minimum of eight rods should be used. If possible, the radials should continue outward for one quarter wavelength at the lowest frequency of operation. If your tower is not ground mounted, bring it's base ground back to the ground window using multiple lengths of cable as discussed above. Do not run a ground cable directly from the isolated tower to the true ground or a ground loop will surely be created that can allow damaging circulating currents to develop.

This all sounds like a lot of work and expense, but field experience has proven that a system like the one described will withstand direct lightning hits without loss of equipment, air time, or lives.

Get your Glasses out of the case

PERSISTENCE (and a "tear stained" letter) PAYS OFF!!

I worked EP2BQ on Xmas Eve 1978 and QSLed direct the next day. Then on Jan 17, 1979, I worked ZL2SQ who had been the operator at EP2BQ and had been forced to leave the country in a hurry.

Somehow, my QSLs were never answered and except for a stab at it every 3 or 4 years, I had given up on getting an EP2 confirmation.

Then, about a month ago, I decided to give it one last shot and I sent the following to ZL2SQ:

1) My QSL for the EP2BQ QSO
2) My QSL for the ZL2SQ QSO
3) A "made-up" EP2BQ card that only needed his signature as confirmation.
4) Copies of my log sheets for both QSOs.
5) A "tear stained" letter pleading for any kind of confirmation.
6) A flat-full of IRCs

On July 9, I received both the EP2BQ and ZL2SQ QSLs along with a nice, apologetic letter. He mentioned that June 1977 QST had an article on the EP2BQ "story." If anyone has that issue, I would appreciate a copy.

I cannot guarantee the above technique will work in every case, but I was at the end of my rope and decided to blast away with both barrells.

Wayne, W4MPY

Wayne

QSLs by W4MPY
Wayne & Lois Carroll
682 Mt. Pleasant Road
Monetta, SC 29105 U.S.A.
Phone (803) 685-7117

From The Editor

I feel sort of boxed in but thought you might like to see the message from Wayne on the left.

The "THENET" ROM is installed at N4ZC's QTH with real good results. The access call is STNC and it has helped out a lot with the disconnects. We need to thank K4MQG and W4UNP for climbing Roger's 120 foot tower with the storms that we had in the area and installing the G7 antenna. Signals are much improved. WA4KWG has prepared a "Quick Reference" chart for the packetcluster. We hope to have it as an insert with this issue. First users of the DXBASE from W8ZF indicate it is a GREAT program and a must for all serious DXers with a PC. Its really neat when you log your DX contact and then push the key and have the DX info including Freq/split/etc sent out on the PK system. No word at this time on September meeting. Keep tuned to 147.18 for details.---KD4IL

The Carolina DX Association
President: Ken Boyd WA4UNZ
Vice Pres: Skip Richardson WA4UUP
Sec/Tres: Bill Jennings W4UNP
Net Mgr: Henry Elwell N4UH
Editor: Bill Taylor KD4IL
Address all Pileup correspondence to KD4IL,
POBox 232
Fort Mill, SC 29716-0232

Notice

The current rate for CDXA dues are $30 for packet using members and $15 otherwise. Dues payments should be sent to:

W4UNP, Bill Jennings
630 Whitepine Drive
Catawba, SC 29704